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JC957 U.S. PTO

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A

Practitioner's Docket No. 10004

PATENT

Preliminary Classification:  
Proposed Class:  
Subclass:

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Box Patent Application  
Assistant Commissioner for Patents  
Washington, D.C. 20231

JC920 U.S. PTO  
09/698332  
10/27/00

NEW APPLICATION TRANSMITTAL

Transmitted herewith for filing is the patent application of

Inventor(s): Alexander Elias Napoles; Alexander Alfred Napoles

For (title): Method for Fumigating Perishables Within a Refrigerated Cargo Container

1. Type of Application

This transmittal is for an original (nonprovisional) application.

2. Papers Enclosed

A. Required for filing date under 37 C.F.R. 1.53(b) (Regular) or 37 C.F.R. 1.153 (Design)

**CERTIFICATION UNDER 37 C.F.R. SECTIONS 1.8(a) AND 1.10\***  
(When using Express Mail, the Express Mail label number is **mandatory**,  
Express Mail certification is optional.)

I hereby certify that, on the date shown below, this correspondence is being:

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37 C.F.R. Section 1.8(a)

37 C.F.R. Section 1.10\*

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TRANSMISSION

☐ transmitted by facsimile to the Patent and Trademark Office (703) \_\_\_\_\_.

Date: 10-27-2000

Signature

Ruben Alcobas, Esq.  
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Application

23 Page(s) of Specification : including claims  
7 Page(s) of Claims  
3 Sheet(s) of Drawing(s)--Formal

**B. Other Papers Enclosed**

3 Page(s) of declaration and power of attorney  
1 Page(s) of abstract  
13 Page(s) of Cover letter and Assingment; petition to make special; ids;

**3. Additional Papers Enclosed**

Information Disclosure Statement (37 C.F.R. 1.98)

Form PTO-1449 (PTO/SB/08A and 08B)

return postcard

**4. Declaration or Oath**

Enclosed

Executed by:  
\* inventors.

**5. Inventorship Statement**

The inventorship for all the claims in this application is the same.

**6. Language**

English

**7. Assignment**

An assignment of the invention to U.S.D.A. Quarantine Fumigation Services, Inc. is attached. A separate "COVER SHEET FOR ASSIGNMENT (DOCUMENT) ACCOMPANYING NEW PATENT APPLICATION" is also attached.

**8. Fee Calculation (37 C.F.R. Section 1.16)**

Regular Application

CLAIMS AS FILED					
Claims	Number Filed	Basic Fee Allowance	Number Extra	Rate	Basic Fee 37 CFR 1.16(a) \$710.00
Total Claims (37 CFR 1.16(c))	20	- 20 =	0 x	\$18.00	\$0.00
Independent Claims (37 CFR 1.16(b))	5	- 3 =	2 x	\$80.00	\$160.00
Multiple Dependent Claim(s), if any (37 CFR 1.16(d))			+	\$260.00	\$0.00

Filing Fee Calculation

\$870.00

**9. Small Entity Statement(s)**

Statement that this is a filing by a small entity under 37 C.F.R. Sections 1.9 and 1.27 is attached.

Filing Fee Calculation (50% of above)

\$435.00

**10. Fee Payment Being Made at This Time**

Enclosed

Filing Fee

\$435.00

Recording assignment (\$40; 37 C.F.R. Section 1.21(h)) (See attached "COVER SHEET FOR ASSIGNMENT ACCOMPANYING NEW APPLICATION".)

\$40.00

**Total Fees Enclosed**

**\$475.00**


**11. Method of Payment of Fees**

Check in the amount of \$475.00 is attached.

**12. Instructions as to Overpayment**

Refund.

Reg. No.: 44,499  
Tel. No.: 305-265-7772

  
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Signature of Practitioner  
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00/2007" 22286960

# TITLE

## Method for Fumigating Perishables Within a

### Refrigerated Cargo Container

By

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and

Alexander Alfred Napoles

## BACKGROUND

The United States of America requires that imported perishables be inspected for pests upon arrival to U. S. Ports of entry. If pests are detected in the perishables, then the U.S. inspector will determine if the in-coming perishables need to be fumigated before leaving the United States Custom's quarantine areas. The reason for fumigating perishables is to eliminate any pests that the perishables may bring with them from foreign countries.

It is highly desirable that the amount of fumigant being released into our atmosphere during the fumigation of perishables be reduced. Today, there are two common methods of fumigating perishables. The first method requires tenting the cargo containers containing the perishables once the perishables have been taken to a site suitable for fumigation. The second method requires the taking of perishable in a container to a fixed site, unloading the perishable onto the fixed site, then carrying on the fumigation process and lastly, reloading the perishable to the cargo container that brought the perishable to the fixed site.

The first method of fumigation, the tenting, has the inherent disadvantage of having to fumigate a greater amount of cubic footage than would be required if the fumigation process would be carried out inside the cargo carrying container without the tenting. The fumigation of a greater amount of cubic footage in turn releases a greater amount of fumigant to our environment. The United States,

through its statutes has stipulated that the amount of the fumigant, if the fumigant is methyl bromide, must be reduced by 50 percent by the year 2000. Another disadvantage that is associated with tenting is that the process can only be carried out when the weather is favorable, that is to say that if the wind is blowing too strong, the tenting should be avoided, for the chances of having the tented environment produce leaks is greatly enhanced. In the same line of thinking, The Plant Protection Quarantine Manual, PPQ 04/98-01 page 2.2.19, states that even in the best conditions, some gas will escape tented enclosures. Yet another disadvantage of tenting the cargo containers is that the sharp angles of the cargo container could tear the tarpaulins used to tent the containers, this would occur to either changes in weather or mishaps, such as the pulling of the tarpaulins due to a physical accident affecting the tented environment.

The second method of fumigation has the following disadvantages. First, by having to transport the perishables from location to location and the loading and unloading at each location, the life of the perishables are shortened due to the changes in temperature that the perishables experience, that is going from a refrigerated environment to one that is not refrigerated and back to a refrigerated environment. Second, it is not unusual to have mishaps in the loading and unloading of the perishables, the spillage of the perishables being fumigated. Thirdly, the amount of time and manpower required to carry out the process due to the loading and unloading is greatly increased, as opposed to just carrying out the fumigation process inside the cargo container.

Today, perishables are being fumigated with methyl bromide prior to being released from customs. Methyl bromide is a fumigant that is effective in eradicating pests that may be lying on perishables entering this country. Methyl bromide is a gas that is highly toxic and is detrimental to our environment, for this reason, the United States wants to phase out the practice of using methyl bromide in this type of fumigations. The problem that the U.S. encounters in phasing out this gas is that to date, methyl bromide is the most effective gas, workable, in eliminating pests from perishables coming into this country. Other chemicals may be used to eradicate pests, but to date methyl bromide has proven to create the least amount of toxic residue to the areas being fumigated, this in turn benefits the people applying the fumigant for they are not exposed to unsafe levels of fumigant. The reason for this is that methyl bromide disperses into the atmosphere at quicker rates than some of the other fumigants currently available for fumigations during the aeration process. The level of residue acceptable of methyl bromide gas after fumigations is five part per million.

Information relevant to attempts to address these problems can be found in U.S. Patents 6,047,496, 5,678,352, 5,662,865, 5,318,789 and 4,966,755.

U.S. Patents 6,047,496 and 5,678,352 address the issue of reducing the amount of toxic agent being released into the environment by providing an improved structural fumigation process of using a non-flammable liquid cryogenic material which is vaporized to function as a carrier for the toxic agent. The patents do not address as how to minimize the area being fumigated nor do they suggest fumigating the perishables in a refrigerated environment.

U.S. Patent 5,662,865 show an apparatus for fumigations with phosphine gas that form a circulatory loop that minimizes the disposal problems associated with phosphine gas. The patent is not geared toward the fumigation of perishables coming into this country, for phosphine gas requires a greater amount of time for the fumigation treatment of perishables to be effective.

U.S. Patent 5,318,789 teaches how to package a commodity in a fumigation container, fumigating the commodity and shipping the commodity in the container. The patent is geared towards keeping fumigated commodities pest free in a sealed container after fumigation has occurred in this country. The patent requires the taking of the containers to chambers to carry out the fumigation. The present invention would conduct the fumigation in the refrigerated cargo container and thereby eliminate the dangers associated with mishaps, such as spills.

U.S. Patent 4,966,755 describes an enclosure device, a tent, that would surround the item(s) being fumigated. The enclosure devise appears to be pieces of materials that are connected to each other so that fumigation can be undertaken inside of said pieces once connected. The device requires one to tent the item(s) to be fumigated.

For the forgoing reasons, there is a need for a method for fumigating perishables within an existing refrigerated cargo container that will reduce the amount of fumigant released into the atmosphere by at least thirty percent, if the fumigation process is carried out in a refrigerated cargo container, while at the same time prolonging the life of the perishables being fumigated. In addition, the method can be performed in weather conditions that would not permit the tenting method.

## SUMMARY

The present invention is directed to a method of reducing the amount of fumigant used during the fumigation of perishables and in which the method has the inherent advantage of prolonging the life of the perishable being fumigated. The method comprises of preparing an existing refrigerated cargo container that has already been transported to a site that meets the safety standards for fumigation of perishables. The method is conducted using an existing refrigerated cargo container that has the following physical attributes: two front and two rear drain holes, an air exchanger, a pair of doors that form a seal do to their construction and a refrigeration system. The method commences by first visually checking the outside of the refrigerated cargo container for any signs of damaged areas that may lead to leaks occurring. If damaged areas found, then sealing said damaged areas with a sealant, if possible, if damaged areas prove to be beyond repair, then do not proceed with the aforementioned method. Then placing at least one fan within the refrigerated container, this step can be done at this juncture or at any other juncture so long as one fan is connected to the gas introduction hose prior to the commencement of the fumigation process, the amount of fans required are dependant on the cubic footage of the container or the method of the invention being used. The next step would be to clear two of the drain holes in said refrigerated container. Through one of the drain holes cleared introduce a gas introduction hose, said gas introduction hose would be connected to one of the fans earlier introduced or to the fan earlier introduced, the fan would be positioned to blow the fumigant toward the front or the rear of the refrigerated container so that the fumigant introduced into the container can be dispersed within. Through the other drain hole cleared introduce reading lines and electrical lines for powering the fans or fan within the refrigerated container. The reading lines should be placed in the container according to the placement required by the PPQ manual or any other governmental guidelines for fumigations intact at the time of the fumigation process. After introducing the gas introduction hose, the reading lines and the electrical lines through the above drain holes seal the drain holes with any available commercial sealant that would prevent fumigant leakage. Then, plug the drain holes not cleared with a plugging means that would prevent fumigant leakage from the drain holes not cleared. Prior to conducting the fumigation or any other type of pressure tests, close the air exchanger of the refrigerated container. Then check the temperature of the perishable to be fumigated and determining the dosage of fumigant to be used during the fumigation process. Then, close and secure the doors of said refrigerated cargo container and then commence the fumigation process by releasing the fumigant through the gas introduction hose into said container. While releasing the fumigant into the





procedures would be eliminated. The process would be conducted exactly as above, except for the aforementioned step of closing the air exchanger.

In a further embodiment of the invention, the above procedure would be carried out while the refrigeration system of the refrigerated cargo container is running. This embodiment would eliminate the need of extra fans beside the fan required to introduce the fumigant into the refrigerated cargo container. The fan would serve to circulate the fumigant evenly within the cargo container and would prolong the life of the perishable being fumigated.

Another embodiment of the invention would add the further step of conducting a pressure test of said container prior to the commencement of the fumigation process.

Accordingly, it is a principle object of the invention to reduce the amount of fumigant required to fumigate incoming perishables. Because less fumigant is used during the fumigation process, less fumigant is released during the aeration step of the fumigation process, thereby reducing the harm that the fumigant does to our environment.

It is another object of the invention to prolong the life of the perishable being fumigated, this is accomplished by maintaining the perishable refrigerated during the refrigeration process and by exposing the perishable to less fumigant during the initial introduction of the fumigant into the refrigerated cargo container.

It is another object of the invention to reduce spillage associated with having to move a perishable from a cargo container to a fumigation site back onto a cargo container.

Yet another object of the invention is that it allows the perishable to be processed through the custom's quarantine areas at a quicker pace than would be accomplished if having to load and unload the perishables at the fumigation sites or if having to tent the containers carrying the perishables.

Another object of the invention is that the fumigation process can be carried out under weather conditions that would not otherwise permit the fumigation process to be carried out under, such as windy conditions.

These and other objects of the present invention will become readily apparent upon further review of the following specifications and drawings.

## DRAWINGS

These and other features, aspects, and advantages of the present invention will become better understood with regard to the following description, appended claims, and accompanying drawings where:

Fig. 1 is an isometric view, containing several cutaways, of an existing refrigerated cargo container that is setup for fumigation using the principles of the present invention.

Fig. 2 is a perspective view of an existing refrigerated cargo container that is used to fumigate using the principles of the present invention.

Fig. 3 is another isometric view, containing several cutaways, of an existing refrigerated cargo container that is setup for fumigation using the principles of the present invention.

## DESCRIPTION

Fig. 1 shows a prepared refrigerated cargo container for the fumigation of perishables, the perishables to be fumigated are not shown in Fig. 1, the perishables would be placed inside of the container according to U.S.D.A. or any other governmental agency guidelines for fumigations prior to conducting the method that follows.

The prepared refrigerated cargo container as shown in Fig. 1 is prepared by a method according to the present invention for fumigating perishables within a refrigerated cargo container **10**, wherein said container **10** comprises of a pair of front drain holes **12**, a pair of rear drain holes **14**, an air exchanger **16**, a pair of doors **17** located at the rear of said container **10** and a refrigeration system

18, said method of fumigation comprises the steps of visually checking the outside of said container 10 for any damaged areas; if damaged areas are found, then sealing said damaged areas to prevent fumigant leakage; placing and locating at least one fan 20, 24 within said container; clearing the pair of rear drain holes 14 of said container 10; inserting through one of the cleared rear drain holes 14 a gas introduction hose 22 and then connecting said gas introduction hose 22 to one of the fans 24 earlier placed into the container or to the fan 24 earlier placed into said container 10 and positioning said fan 24 and hose 22 connection so that the fumigant introduced into said container 10 blows towards the front or the rear of said container 10; inserting through the other rear drain hole 14 a plurality of reading lines 26 for measuring the dispersion of fumigant within said container 10 and an electrical line 28 for powering the fan 24 or fans 20, 24 within said container 10; positioning said reading lines 26 within said container 10; then sealing the rear drain holes 14 with a means for sealing the rear drain holes that will prevent fumigant from escaping through the rear drain holes 14; plugging the front drain holes 12 with a means for plugging holes that will prevent fumigant from escaping through the front drain holes 12; closing the air exchanger 16 prior to the fumigation of the perishables; checking the temperature of the perishable to be fumigated; determining the dosage of fumigant to be used to fumigate the perishable; closing and securing the doors 17 of the container 10; releasing the fumigant required to fumigate the perishables through the gas introduction hose 22 into said container 10; checking with a gas or a halide detector the outside of said container 10 for any fumigant leaks; if leaks are discovered, then sealing the areas of the container found to have leaks with a means for sealing the areas found to have leaks; then re-checking the areas of the container that where found to have leaks; if leaks are controlled to an acceptable level, then conducting the fumigation process; and lastly aerating the perishable fumigated for the amount of time needed to clear the container of the fumigant used in the fumigation process.

In the visually checking the container step, the fumigator would walk around the container 10 and look for any dents or gashes on the outside of the container that may identify areas that would allow the fumigant to escape. The fumigator would also check the underside of the container and the top of the container for any of the aforementioned defects. If the fumigator finds any of the aforementioned defects that prove to be beyond correction, the fumigation of perishables according to this process would not be carried out.







amount of time required by the U.S.D.A. or any other governmental agency guidelines for the fumigations of perishables. On the other hand, if the leakage of fumigant cannot be controlled to a satisfactory level, then the container will be tented and the fumigation process will be carried out using the old procedure for the fumigation of perishables.

And lastly, in the aerating step, the doors **17** of the container **10** are opened and the perishables are aerated in the manner and for the period required by the U.S.D.A. or any other governmental agency guidelines for fumigations. The perishables will be aerated until the parts per million present in the container are reduced to an acceptable level, the acceptable level of fumigant is determined by the governmental agency overseeing the fumigation procedure. Currently, when aerating a container of methyl bromide, the container will have to be aerated until the concentration of methyl bromide within the container is at most 5 parts per million.

In a variation of the present invention, the drain holes cleared would be the front drain holes and the drain holes plugged would be the rear drain holes. The gas introduction hose, the reading lines and the electrical lines would be inserted through the front drain holes. The sealing and plugging procedures of the drain holes would be conducted as above mentioned, but for the drain holes sealed and plugged would be alternated, more specifically the front drain holes would be sealed and the rear drain holes would be plugged. The remaining steps would be conducted in the same manner as above.

In still a further variation of the present invention, the drain holes cleared may be a combination of one front drain hole and one rear drain hole. The gas introduction hose would either be inserted through one of the cleared front drain holes or one of the cleared rear drain holes and the reading and electrical lines would be inserted through the other cleared drain hole. The sealing and plugging procedures of the drain holes would be conducted as above mentioned, but for the drain holes sealed and plugged would be as follows; the cleared drain holes would be sealed after inserting the gas introduction hose, the reading lines and the electrical lines through them and the remaining drain holes would be plugged. The remaining steps would be conducted in the same manner as above.

In another embodiment of the present invention, the refrigerated cargo container will not have an air exchanger and the step relating to the closing of the air exchanger will be eliminated during the



fumigation procedure. The method for fumigating perishables would be conducted in the same manner as above, but for the step of closing the air exchanger.

In another embodiment of the present invention, all of the drain holes in the refrigerated cargo container will be plugged using the aforementioned method for plugging drain holes. The step of clearing the drain holes aforementioned will be eliminated from the process. The gas introduction hose, the reading lines and the electrical lines will be inserted through the air exchanger and placed and connected as above mentioned. The air exchanger will be sealed using a sealing means. The air exchanger will be sealed by placing putty around the gas introduction hose, the reading lines and the electrical lines inserted through the air exchanger until the putty surrounding the hoses and lines form a seal with the body of the air exchanger. The sealing means can be formed by any other materials that have a similar malleability to putty.

In a further embodiment of the aforementioned inventions, the fumigation process would be conducted while running the refrigeration system of the refrigerated cargo container during the fumigation process. It is foreseeable that the amount of fans placed within the container will be reduced using this embodiment of the invention.

Fig. 3 shows another embodiment of the present invention. In this embodiment, only one fan **24** is introduced into the container, the fan **24** introduced into the container **10** serves the purpose of introducing the fumigant into the container **10**. The refrigeration system **18** would substitute for the amount of fans required to circulate the fumigant within the container **10**. The method for fumigating perishables would be conducted in the same manner as above.

In a further embodiment of the aforementioned inventions, a pressure test of the container can be carried out prior to the commencement of the fumigation process after the doors of the container have been closed and secured. Methods of conducting pressure tests are known in the art and will not be discussed further.

The above methods would be used after perishables are inspected for pests upon arrival to U. S. Ports of entry. If pests are detected, then the U.S. inspector will determine if the in-coming perishables need to be fumigated before leaving the United States Custom's quarantine areas. If the inspector decides that the perishables need to be fumigated, the inspector will have the perishables



Although the present invention has been described in considerable detail with reference to certain preferred versions thereof, other versions are possible. Therefore the spirit and scope of the claims should not be limited to the description of the preferred versions contained herein.

## CLAIMS

What is claimed is:

1. A method for fumigating perishables within a refrigerated cargo container, wherein said refrigerated container comprises of a pair of front and a pair of rear drain holes, an air exchanger, a pair of doors located at the rear of said container, and a refrigeration system, said method for fumigation comprising:
  - checking said container for any damaged areas;
  - if damaged areas found, then sealing said damaged areas with a means for sealing said damaged areas;
  - placing at least one fan within said container;
  - clearing the pair of rear drain holes of said container;
  - inserting through one of the rear drain holes a gas introduction hose, then connecting said gas introduction hose to one of the fans earlier placed within said container or to the fan earlier placed in said container;
  - inserting through the other rear drain hole a plurality of reading lines for measuring the dispersion of fumigant within said container and an electrical line for powering said fans or fan;
  - positioning said reading lines within said container;
  - sealing the rear drain holes with a means for sealing the rear drain holes;
  - plugging the front drain holes with a means for plugging holes;
  - closing the air exchanger;
  - checking the temperature of the perishable to be fumigated;
  - determining the dosage of fumigant to be used in the fumigation process;
  - closing and securing the doors of the refrigerated cargo container;
  - releasing the fumigant required to fumigate through the gas introduction hose into said container;
  - checking with a gas or a halide detector the outside of said container for any fumigant leaks;
  - if leaks are discovered, then sealing the areas of said container found to have leaks with a means for sealing the areas found to have leaks;



checking the temperature of the perishable to be fumigated;

determining the dosage of fumigant to be used in the fumigation process;

closing and securing the doors of the refrigerated cargo container;

releasing the fumigant required to fumigate through the gas introduction hose into said container;

checking with a gas or a halide detector the outside of said container for any fumigant leaks;

if leaks are discovered, then sealing the areas of said container found to have leaks with a means for sealing the areas found to have leaks;

re-checking with the gas or the halide detector the areas of the container that where discovered to have leaks;

if leaks are controlled, then conducting the fumigation process; and

lastly, aerating the perishable fumigated for the required amount of time needed to clear the container of the fumigant used in the fumigation process.

6. The method for fumigating perishables within the refrigerated cargo container of claim 5, wherein the refrigerated container is refrigerating the perishable during the fumigation process.
7. The method for fumigating perishables within the refrigerated cargo container of claim 5, which further comprises conducting a pressure test of said refrigerated container prior to the application of the fumigant.
8. The method for fumigating perishables within the refrigerated cargo container of claim 7, wherein the refrigerated container is refrigerating the perishable during the fumigation process.
9. A method for fumigating perishables within a refrigerated cargo container, wherein said refrigerated container comprises of a pair of front and a pair of rear drain holes, an air exchanger, a pair of doors located at the rear of said container, and a refrigeration system, said method for fumigation comprising:
  - checking said container for any damaged areas;
  - if damaged areas found, then sealing said damaged areas with a means for sealing said damaged areas;
  - placing at least one fan within said container;
  - clearing one of the front drain holes and one of the rear drain holes of said container;

inserting through one of the cleared drain holes a gas introduction hose, then connecting said gas introduction hose to one of the fans earlier placed within said container or to the fan earlier placed in said container;

inserting through the other cleared drain hole a plurality of reading lines for measuring the dispersion of fumigant within said container and an electrical line for powering said fans;

positioning said reading lines within said container;

sealing the cleared drain holes with a means for sealing the cleared drain holes;

plugging the remaining drain holes with a means for plugging holes;

closing the air exchanger;

checking the temperature of the perishable to be fumigated;

determining the dosage of fumigant to be used in the fumigation process;

closing and securing the doors of the refrigerated cargo container;

releasing the fumigant required to fumigate through the gas introduction hose into said container;

checking with a gas or a halide detector the outside of said container for any fumigant leaks;

if leaks are discovered, then sealing the areas of said container found to have leaks with a means for sealing the areas found to have leaks;

re-checking with the gas or the halide detector the areas of the container that where discovered to have leaks;

if leaks are controlled, then conducting the fumigation process; and

lastly, aerating the perishable fumigated for the required amount of time needed to clear the container of the fumigant used in the fumigation process.

10. The method for fumigating perishables within the refrigerated cargo container of claim 9, wherein the refrigerated container is refrigerating the perishable during the fumigation process.
11. The method for fumigating perishables within the refrigerated cargo container of claim 9, which further comprises conducting a pressure test of said refrigerated container prior to the application of the fumigant.
12. The method for fumigating perishables within the refrigerated cargo container of claim 11, wherein the refrigerated container is refrigerating the perishable during the fumigation process.

13. A method for fumigating perishables within a refrigerated cargo container, wherein said refrigerated container comprises of a pair of front and a pair of rear drain holes, an air exchanger, a pair of doors located at the rear of said container, and a refrigeration system, said method for fumigation comprising:

checking said container for any damaged areas;  
if damaged areas found, then sealing said damaged areas with a means for sealing said damaged areas;  
placing at least one fan within said container;  
inserting through the air exchanger a gas introduction hose, then connecting said gas introduction hose to one of the fans earlier placed within said container or to the fan earlier placed in said container;  
inserting through the air exchanger a plurality of reading lines for measuring the dispersion of fumigant within said container and an electrical line for powering said fans;  
positioning said reading lines within said container;  
sealing the air exchanger with a means for sealing the air exchanger;  
plugging the front and rear drain holes with a means for plugging holes;  
checking the temperature of the perishable to be fumigated;  
determining the dosage of fumigant to be used in the fumigation process;  
closing and securing the doors of the refrigerated cargo container;  
releasing the fumigant required to fumigate through the gas introduction hose into said container;  
checking with a gas or a halide detector the outside of said container for any fumigant leaks;  
if leaks are discovered, then sealing the areas of said container found to have leaks with a means for sealing the areas found to have leaks;  
re-checking with the gas or the halide detector the areas of the container that where discovered to have leaks;  
if leaks are controlled, then conducting the fumigation process; and  
lastly, aerating the perishable fumigated for the required amount of time needed to clear the container of the fumigant used in the fumigation process.



14. The method for fumigating perishables within the refrigerated cargo container of claim 13, wherein the refrigerated container is refrigerating the perishable during the fumigation process.
15. The method for fumigating perishables within the refrigerated cargo container of claim 13, which further comprises conducting a pressure test of said refrigerated container prior to the application of the fumigant.
16. The method for fumigating perishables within the refrigerated cargo container of claim 15, wherein the refrigerated container is refrigerating the perishable during the fumigation process.
17. A method for fumigating perishables within a refrigerated cargo container, wherein said refrigerated container comprises of a pair of front and a pair of rear drain holes, a pair of doors located at the rear of said container, and a refrigeration system, said method for fumigation comprising:
- checking said container for any damaged areas;
  - if damaged areas found, then sealing said damaged areas with a means for sealing said damaged areas;
  - placing at least one fan within said container;
  - clearing the pair of rear drain holes of said container;
  - inserting through one of the rear drain holes a gas introduction hose, then connecting said gas introduction hose to one of the fans earlier placed within said container or to the fan earlier placed in said container;
  - inserting through the other rear drain hole a plurality of reading lines for measuring the dispersion of fumigant within said container and an electrical line for powering said fans;
  - positioning said reading lines within said container;
  - sealing the rear drain holes with a means for sealing the rear drain holes;
  - plugging the front drain holes with a means for plugging holes;
  - checking the temperature of the perishable to be fumigated;
  - determining the dosage of fumigant to be used in the fumigation process;
  - closing and securing the doors of the refrigerated cargo container;
  - releasing the fumigant required to fumigate through the gas introduction hose into said container;

checking with a gas or a halide detector the outside of said container for any fumigant leaks;

if leaks are discovered, then sealing the areas of said container found to have leaks with a means for sealing the areas found to have leaks;

re-checking with the gas or the halide detector the areas of the container that where discovered to have leaks;

if leaks are controlled, then conducting the fumigation process; and

lastly, aerating the perishable fumigated for the required amount of time needed to clear the container of the fumigant used in the fumigation process.

18. The method for fumigating perishables within the refrigerated cargo container of claim 17, wherein the refrigerated container is refrigerating the perishable during the fumigation process.

19. The method for fumigating perishables within the refrigerated cargo container of claim 17, which further comprises conducting a pressure test of said refrigerated container prior to the application of the fumigant.

20. The method for fumigating perishables within the refrigerated cargo container of claim 19, wherein the refrigerated container is refrigerating the perishable during the fumigation process.

## ABSTRACT

A method for fumigation perishables within an existing refrigerated cargo container that does not require the refrigerated cargo container to be tented. The method uses the inherent characteristics of the cargo container to form the fumigation chamber environment. The method insures that the cargo container is fit for fumigation purposes, more specifically, that the refrigerated cargo container does not allow the escape of fumigant beyond the reasonable level allowed by the agency monitoring the fumigation process.

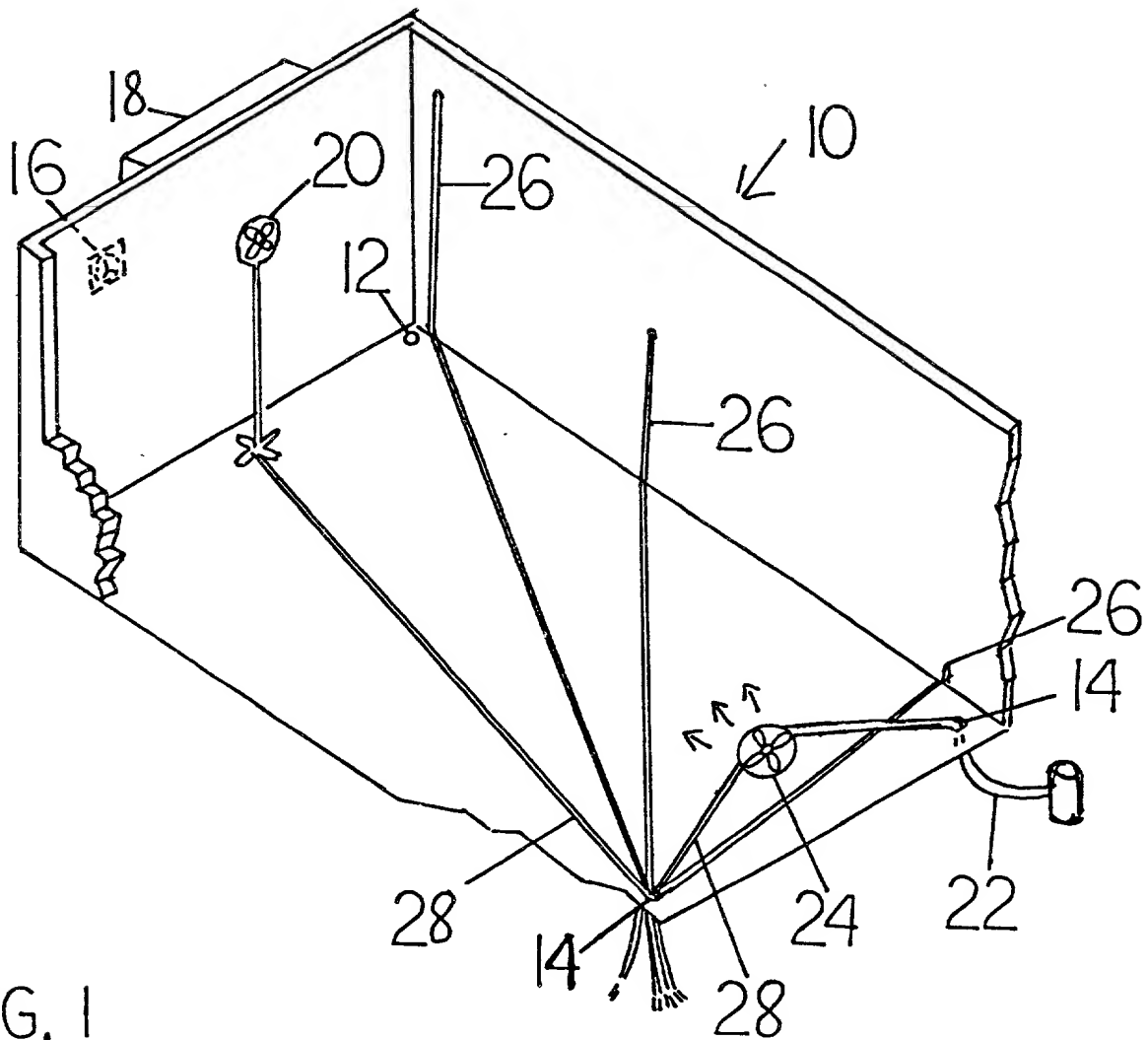


FIG. 1

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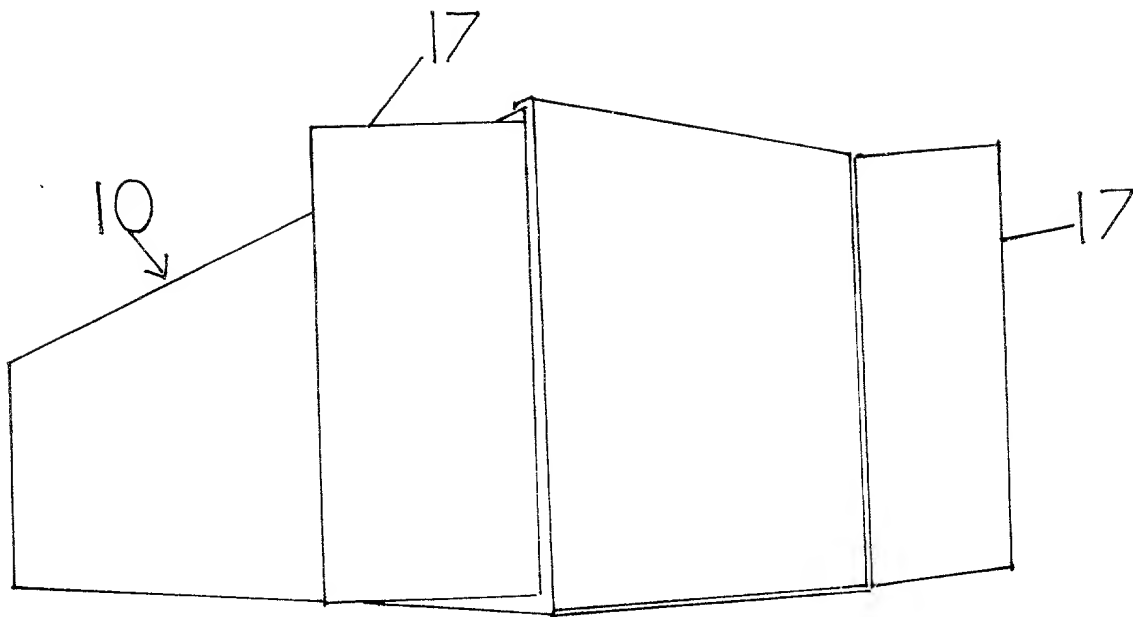


FIG 2

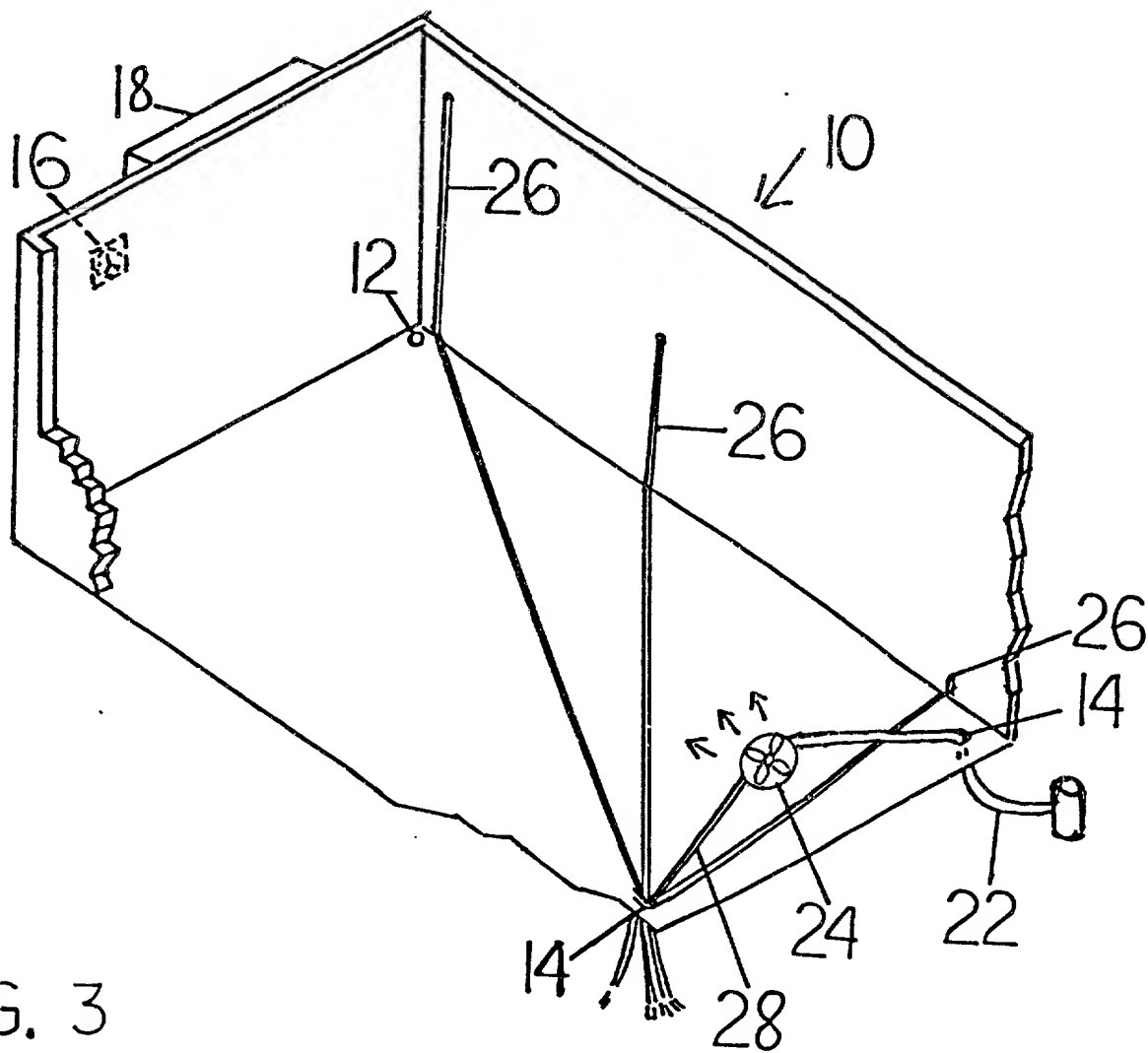


FIG. 3

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**COMBINED DECLARATION AND POWER OF ATTORNEY**

**(ORIGINAL, DESIGN, NATIONAL STAGE OF PCT, SUPPLEMENTAL, DIVISIONAL,  
CONTINUATION, OR C-I-P)**

---

As a below named inventor, I hereby declare that:

**TYPE OF DECLARATION**

This declaration is for an original application.

**INVENTORSHIP IDENTIFICATION**

My residence, post office address and citizenship are as stated below, next to my name. I believe that I am an original, first and joint inventor of the subject matter that is claimed, and for which a patent is sought on the invention entitled:

**TITLE OF INVENTION**

Method for Fumigating Perishables Within a Refrigerated Cargo Container

**SPECIFICATION IDENTIFICATION**

The specification is attached hereto.

**ACKNOWLEDGMENT OF REVIEW OF PAPERS AND DUTY OF CANDOR**

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information, which is material to patentability as defined in 37, Code of Federal Regulations, Section 1.56, and which is material to the examination of this application, namely, information where there is a substantial likelihood that a reasonable Examiner would consider it important in deciding whether to allow the application to issue as a patent, and in compliance with this duty, there is attached an information disclosure statement, in accordance with 37 C.F.R. Section 1.98.

**POWER OF ATTORNEY**

I hereby appoint the following practitioner(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith.

APPOINTED PRACTITIONER(S)

Ruben Yuri Alcoba

REGISTRATION NUMBER(S)

44,499

I hereby appoint the practitioner(s) associated with the Customer Number provided below to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith.

**AUTHORIZATION OF ATTORNEY(S) TO ACCEPT AND FOLLOW INSTRUCTIONS FROM REPRESENTATIVE**

The undersigned to this declaration and power of practitioner hereby authorizes the U.S. practitioner(s) named herein to accept and follow instructions from:

Ruben Alcoba  
6700 S.W. 21st Street, Suite 201  
Miami, FL 33155

as to any actions to be taken in the Patent and Trademark Office regarding this application without direct communication between the U.S. practitioner(s) and the undersigned. In the event of a change in the person(s) from whom instructions may be taken, the U.S. practitioner(s) will be so notified by the undersigned.

SEND CORRESPONDENCE TO

DIRECT TELEPHONE CALLS TO:

Ruben Yuri Alcoba  
305-265-7772

Ruben Yuri Alcoba  
6700 S.W. 21st Street, Suite 201  
Miami, FL 33155

**DECLARATION**

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

**SIGNATURE(S)**

Alexander Elias Napoles

**Inventor's signature**

**Date**

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**Country of Citizenship** USA



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**Country**

Country of Citizenship USA

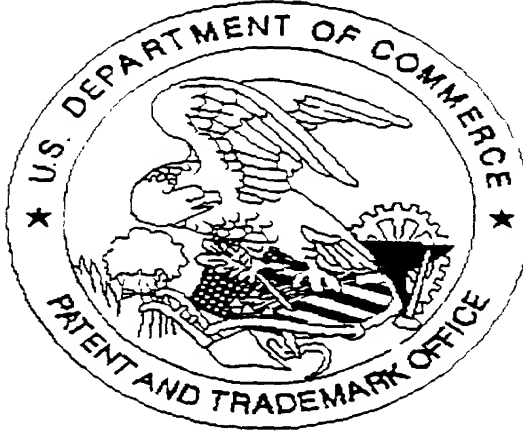
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Figure 1 consists of 12 bar charts, labeled (a) through (l), each representing a different fish species. The species are: (a) Atlantic croaker, (b) Striped bass, (c) Weakfish, (d) Blue crabs, (e) Spot, (f) Rockfish, (g) Bay anchovy, (h) Atlantic silverside, (i) Atlantic herring, (j) Atlantic menhaden, (k) Atlantic bluefish, and (l) Atlantic tomcod. Each chart shows the percentage of the total catch for that species from 1990 to 2001. The y-axis for all charts is 'Percentage of total catch' and ranges from 0 to 100. The x-axis is 'Year' and ranges from 1990 to 2001. Each bar represents the mean percentage for that year, and the error bars represent the standard error. The data shows varying trends for each species over the 12-year period.

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